

2M MTR Strategic Planning Conference 2002

Miniature/Microminiature Electronic Repair Program



Keeping America's Navy #1 in the world

Presenter

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Keeping America's Navy #1 in the world

Topics

- Overview
- Tools and Equipment
- Technical Documentation
- Training and Training Support
- Conclusion



Mission

The 2M Program will provide

- Tools and Equipment
- Technical Documentation
- Training Support

to ensure that electronic repair can be accomplished at the lowest maintenance level practical!

Goals

- Influence development of standards
- Keep technical documents current
- Support curricula maintenance
- Keep repair equipment current
- Fleet support

Objectives

- Establish Government/Industry interface for repair
- Update Certification Plan
- Update 2M curricula
- Update Standard Practices Manual
- Upgrade Technical Training Equipment

Objectives

- Procure 2M equipment upgrades
- Facilitate 2M aboard submarines
- Establish repair capability for BGAs & ceramic substrata
- Improve quality of hand tools

Accomplishments

- Chaired/served on IPC committees for repair standards
 - IPC-7711, Rework of Electronic Assemblies
 - IPC-7721 Repair and Modification of Printed Boards and Electronic Assemblies



Accomplishments

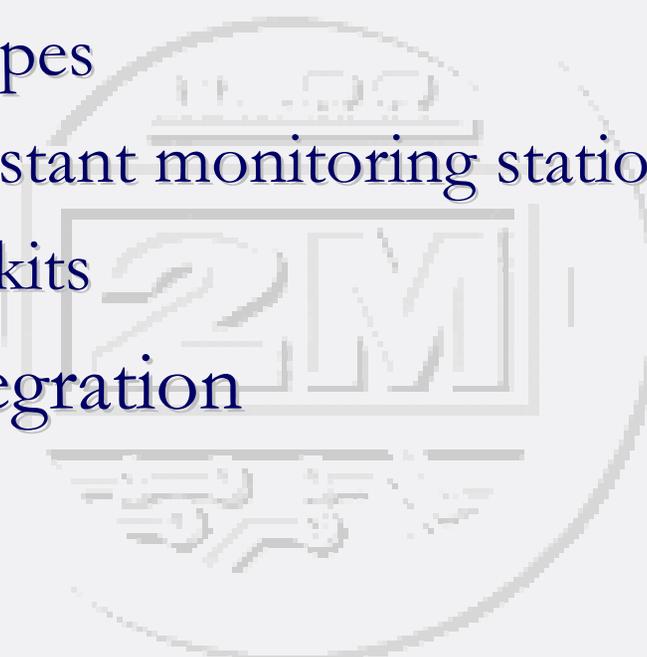
- IPC-7070 series—requirements for component mounting
 - IPC-7071 - General Requirements
 - IPC-7072 - Through-hole
 - IPC-7073 - Standard Surface Mount Technology
 - IPC-7074 - Fine Pitch and High Pin Count
 - IPC-7075 - Fine Pin Count Area Array
 - IPC-7076 - Chip Scale and Chip Size
 - IPC-7077 - Wire Bonding Bare Chip
 - IPC-7078 - Flip Chip (Direct Chip Attach)

Accomplishments

- Started major revision of Standard Practices Manual
 - Parallel with curricula updates
 - Incorporates new Government/ industry standards
- Certification Plan near final
- Exported training

Accomplishments

- Procured
 - Microscopes
 - ESD constant monitoring stations
 - Portable kits
- USCG Integration



Accomplishments

- Exported training continuing
- TF-500 deployments completed?
- New pliers & cutters deployed



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Tools and Equipment

- PRC-2000
- Microscopes
- Portable 2M Station
- ESD Constant Monitoring
- Tool List Upgrades
- TF-500



PRC-2000

- Deployments nearly completed
- Zero procurements planned for FY02



PRC-2000 Issues

- Some units reaching end of life cycle
- Some configuration concerns



Microscopes

- Upgrade for mini capability
- Deployments continuing
- 55 planned for FY02



Microscope Schedule

Fleet Deployments



Microscope Issues

- Micro station upgrades
- Microscope head refurbishment



Portable Tool Kit

- Pace MBT-250
- Subset 2M AEL
- >2 ft³ storage
- No microscope
- 33 planned for FY02



Portable Kit Schedule

Fleet Deployments



Portable Kit Issues

- Are we going to do submarines?
- Future funding
- Requirements for the outyears



ESD Constant Monitoring

- Provides instantaneous feedback
- > 50% of CCA failures due to ESD
- 250 more planned for FY02



ESD Schedule

Fleet Deployments



ESD Issues

- Must be deployed as a system
- Must not be commingled
- Current equipment must be removed

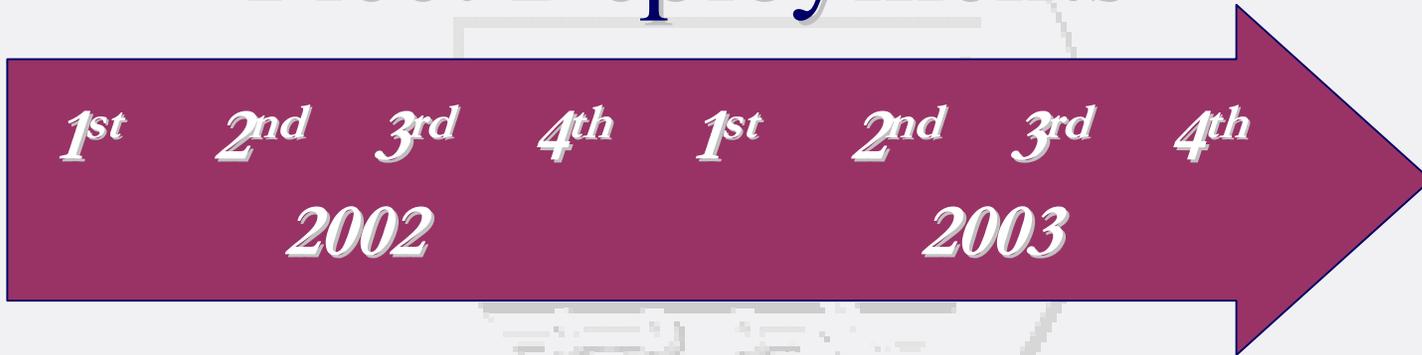


New Tools



Pliers and Cutters Schedule

Fleet Deployments



Tool Issues

- Rust and tool maintenance
- Keeping up with COTS
- Making the kit ESD safe

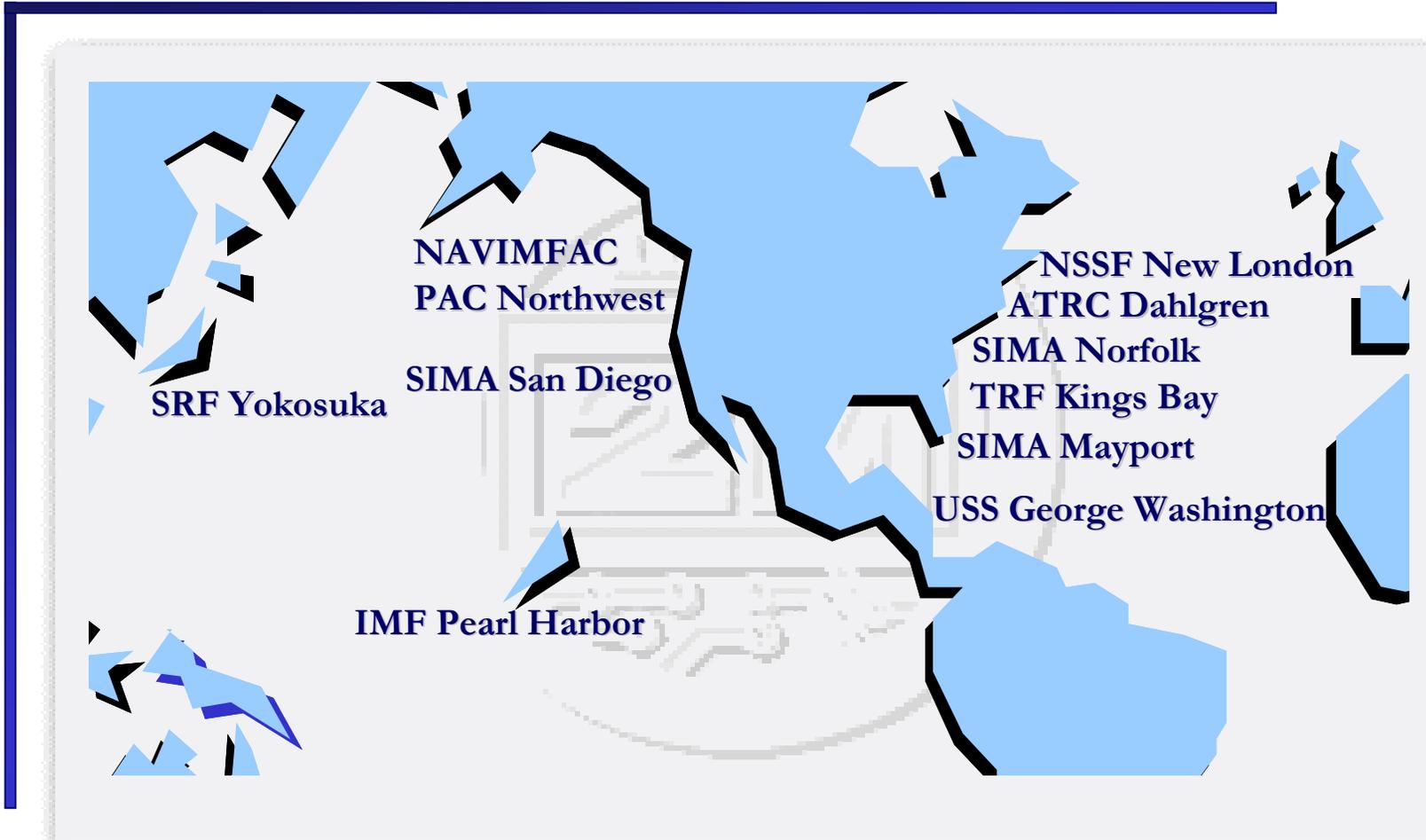


TF-500

- Pace ThermoFlo
- Standard pitch BGAs
 - ~ 30 mil pitch
- High density SMT
 - ~ 20 mil pitch
- Ceramic boards



TF-500 Deployments

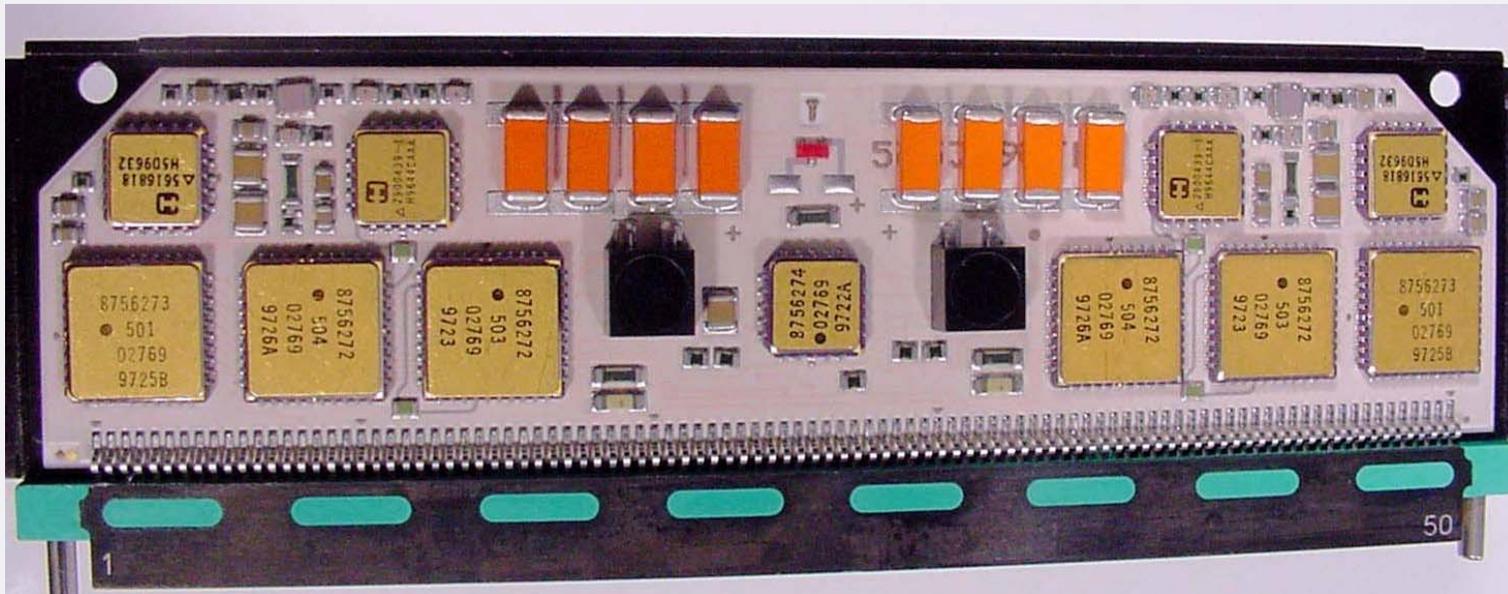


TF-500 Issues

- Other deployments
- Training
- Rework procedures
- New requirements
- Site Reviews



Phase Shift Driver



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Technical Documentation

- Standard Practices Manual
- Equipment Technical Manuals
- Allowance Lists
- Navy Training Plan
- Certification Plan
- Database and Web Page

Standard Practices Manual

- Revision started
 - Reformatting required
 - Incorporate electro-plating (WP 17), jumper wires, multi-layer PTH repair
 - IPC-A-610C & J-STD-001C

PRC-2000 Tech Manual

- Revision is needed
 - Incorporate new handpieces
 - PS-80 Soldering Iron
 - SX-80 Solder Extractor
 - Not started, low priority

MBT-250 Tech Manual

- Draft near completed
- Similar to PRC-2000 technical manual
 - Compilation of commercial manuals
 - Operators
 - Service
 - PS-80
 - SX-80
 - TJ-70

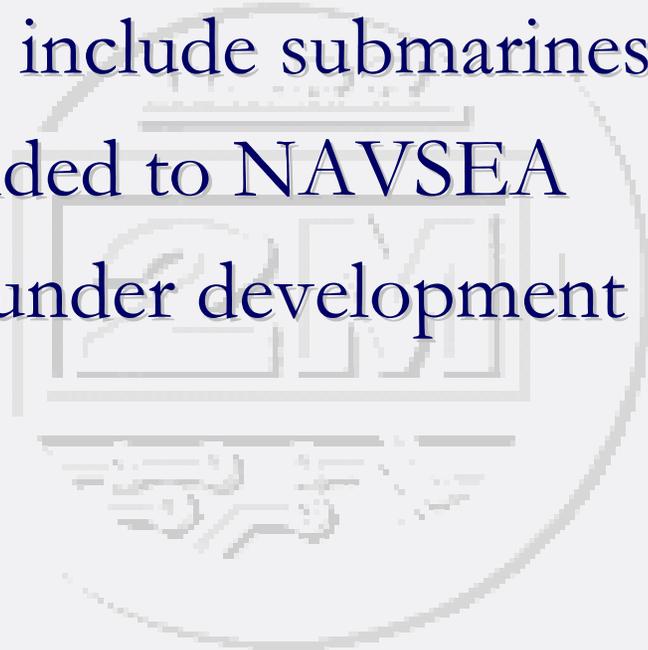
TF-500 ULSS

- Planned draft this FY



Navy Training Plan

- NTP S-30-8711A published 3/97
- Updated to include submarines
- Draft provided to NAVSEA
- New draft under development



Certification Plan

- Revision near completion
- Expected to be out for review early summer



Database

- <https://acrux2.m42.crane.navy.mil>
 - Index page for Inspectors
 - Update equipment and personnel tables
- NMCI puts at risk



Database

- <https://acrux.m42.crane.navy.mil/>
 - Index page for 2M Information
 - Database, tool lists, NTP Master Activities List, review copy of documents under revision, APLs
- NMCI puts at risk

Web Page

- <http://www.crane.navy.mil/2m/>
 - Provides general information
 - Publicly accessible
 - Security limits availability of data

Tool Lists



Technical Documentation

Documentation Issues

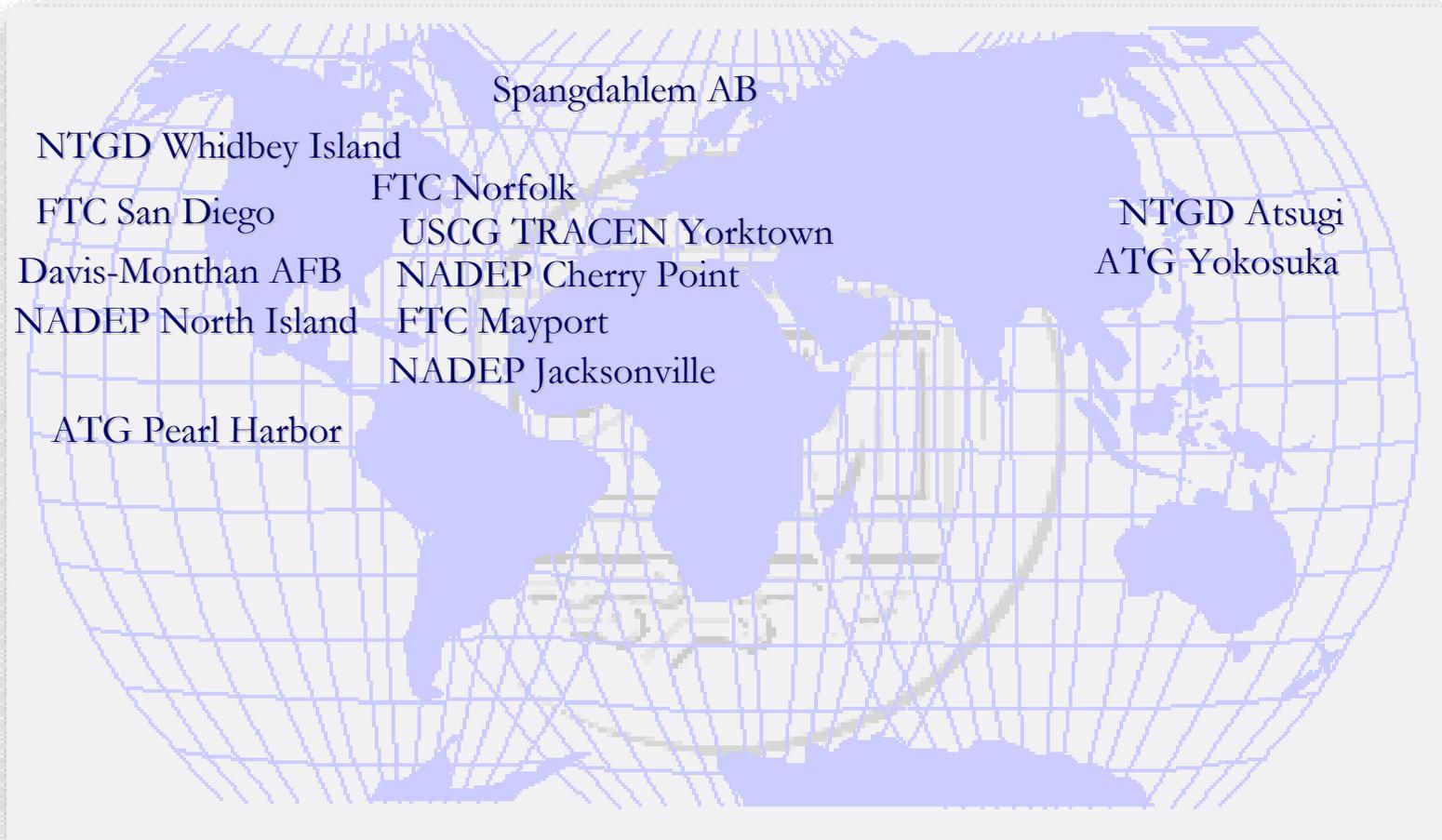
- NMCI
- Documentation priority
- Task Force EXCEL



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2M Training Sites



Training Support

- MMDT
- Yokosuka Training
- Exported Training



MMDT

- Miniature/Microminiature Display Trainer
- Current units worn out
- Replacement contracted



Other TTE

- Computer for Whidbey
- Other computers??



Exported Training

- Portable 2M kit
- Targeted to submarines
 - SUBASE Bangor (TRF)
 - SUBASE Kings Bay (TRF)
 - SUBASE New London
- Ingleside for MCM support

Exported Training



Training and Training Support

Training Issues

- Task Force EXCEL
- Yokosuka online/no instructors
- Exported training
- Other TTE



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Conclusion

The 2M Program addressed the

- Tools and Equipment
- Technical Documentation
- Training & Training Support

to ensure that the Fleet has a first-rate and effective repair capability!

Focus for Next Year

- Keeping technically current
- Pushing equipment to the Fleet
- Submarine support
- Documentation updates
- Keeping training first-rate
- Improving overall Fleet support

Focus for Next Year

- Build on relationship with USAF
- Refine relationship with USMC
- Establish a relationship with USA



Major Program Issues

- NMCI
- NECs
- Equipment Procurement
- ATG Yokosuka Training
- Certification
- Documentation

Major Program Issues

- Workmanship
- Task Force EXCEL
- New Technologies



NMCI

- **Websites**

- Inspector site

<https://acrux2.m42.crane.navy.mil>

- Info site

<https://acrux.m42.crane.navy.mil>

- Public

<http://www.crane.navy.mil/2m/>

NEC Reductions

- 9527 mini
- 9526 micro
- 1591 micro w/MTR
- 9503 inspector
- 9509 instructor



Equipment Procurements

Item	Quantity Needed
Microscopes	38
Portable MN	33
Pliers/cutters	350
ESD CMS	225
TF 500	11

Outfitting

- In general, do we have the correct mix?
- Smaller shore sites Y/N?



Yokosuka Training

- Joint 2M/MTR classroom
- TTE installed two years ago
 - Twelve MTR seats
 - Eight 2M seats
- One classroom remains at Atsugi
- Crane/USAF to train in Yokosuka in July

Yokosuka Classroom



Certification

- Certification Plan
- Uniformity between LANT & PAC
- Portable mini kit & certification

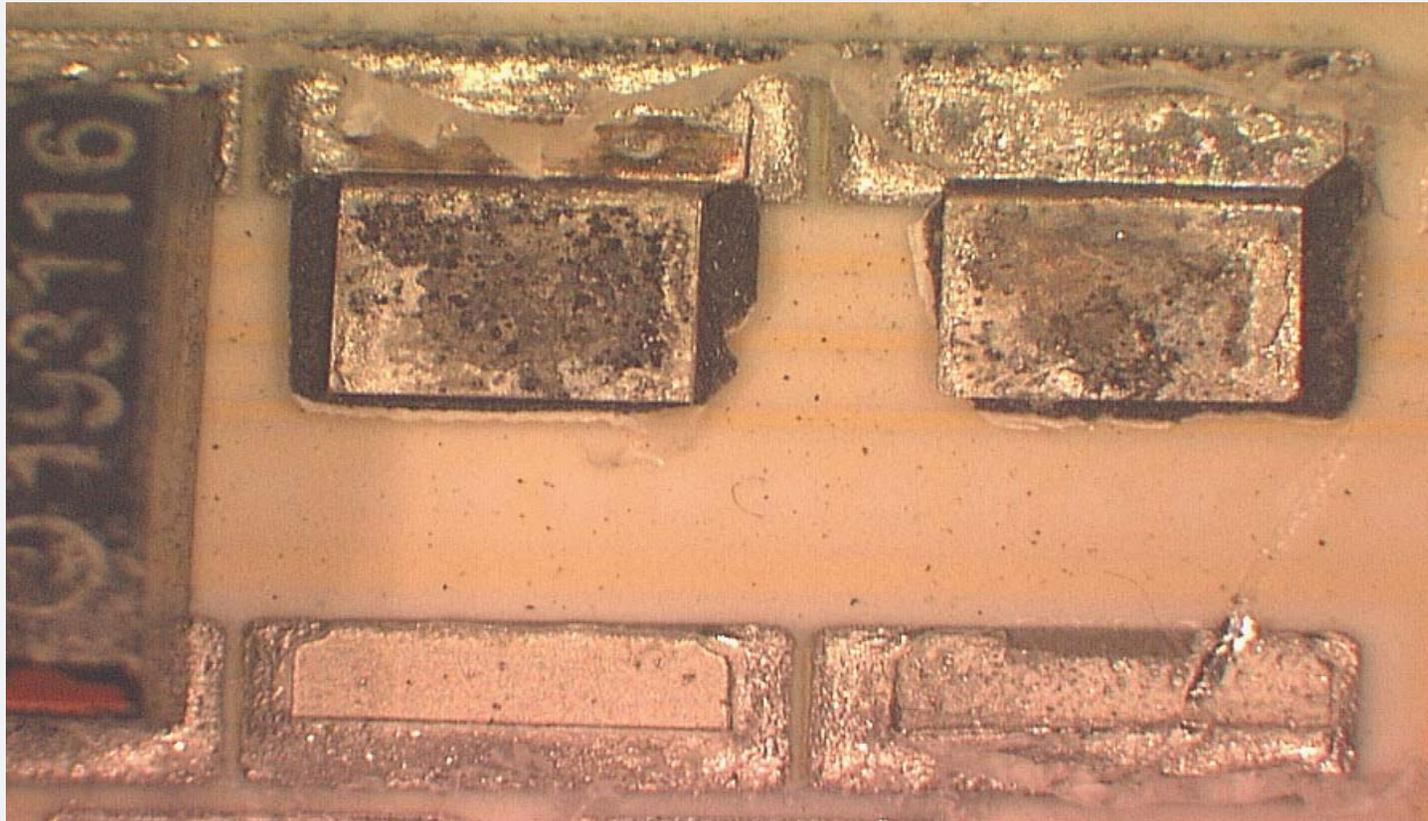


Documentation

- “23” manual
 - First chapter ready for review
- 2M documentation & MTR CDs



Workmanship



Task Force EXCEL

<http://www.excel.navy.mil/>

“The goal is to transform the Navy into a responsive, agile and efficient learning organization that can readily adapt and apply new technologies and new war fighting tactics. To accomplish this we must rethink the way we educate and train our people. Navy training has been “good enough” for long enough. The question is not whether training is meeting today's readiness requirements, but rather whether it will continue to do so in the 21st Century.”



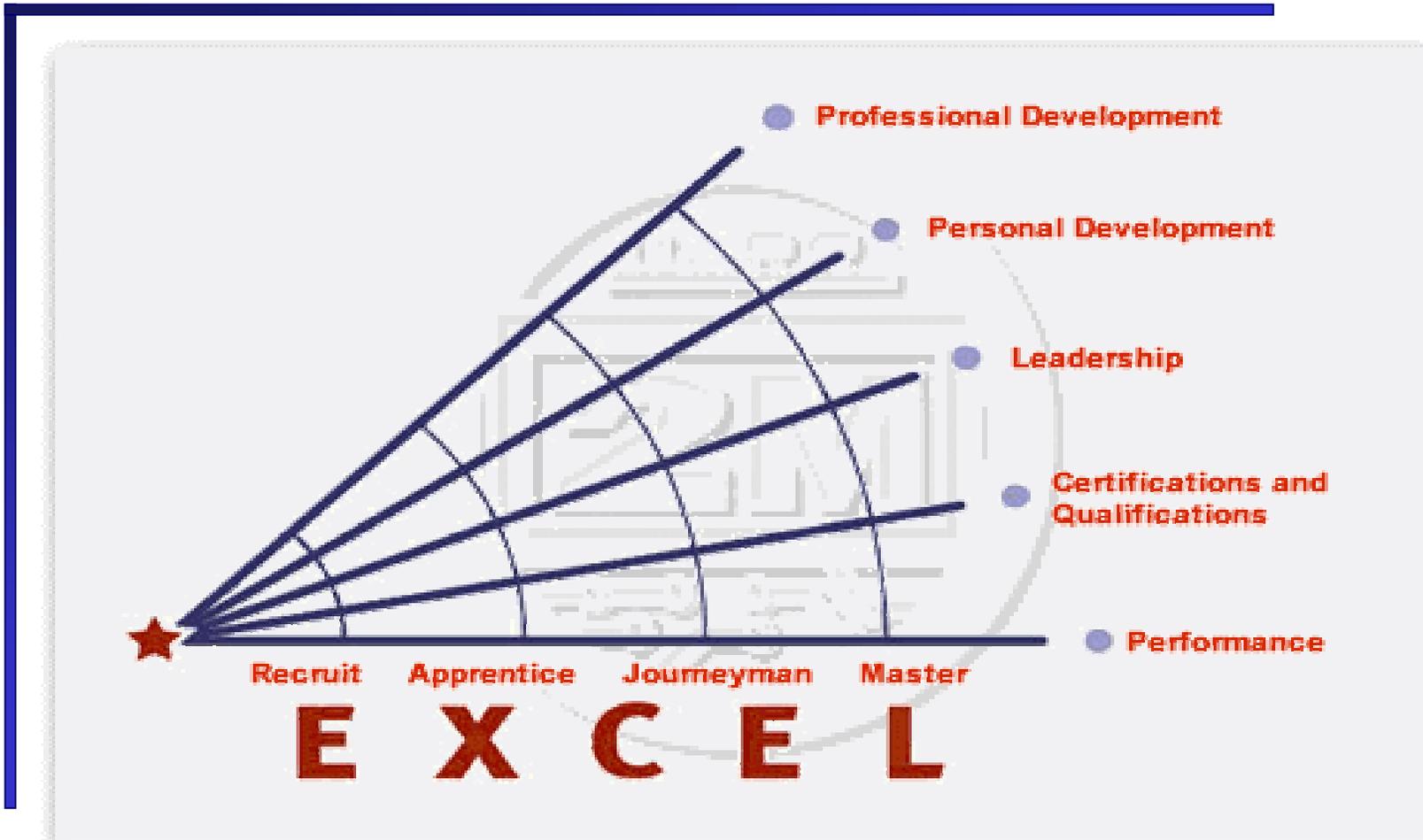
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CNA Study

“What a sailor does on a ‘day-to-day’ basis.”



Sailor Continuum



2M Technician

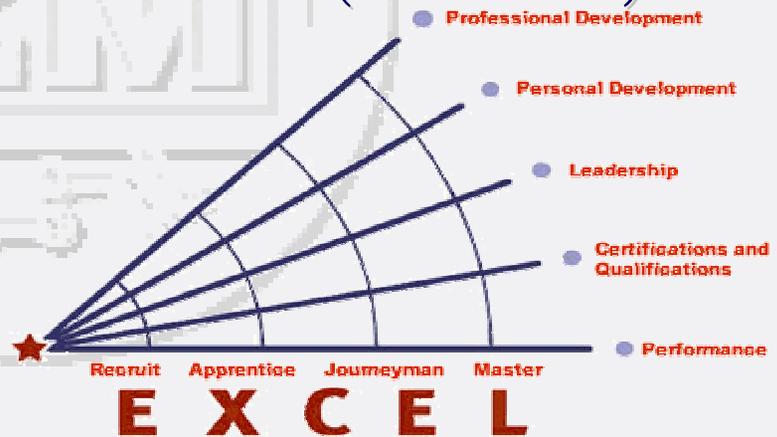
A 2M Technician is expected to be fully qualified upon completion of training and fully capable when reporting aboard to effectively do any and all repairs within the scope of his/her training.



2M Training Proposals

- Current 4 wk mini & 2 wk micro
- 4 wk mini/micro + 1 wk MTR (FTC Norfolk)
- 5 wk mini/micro + 1 wk MTR (community)
- ? wk mini/micro + 1 wk MTR (2M ISEA)

"good enough"
or the best?



MN/MC Consequences

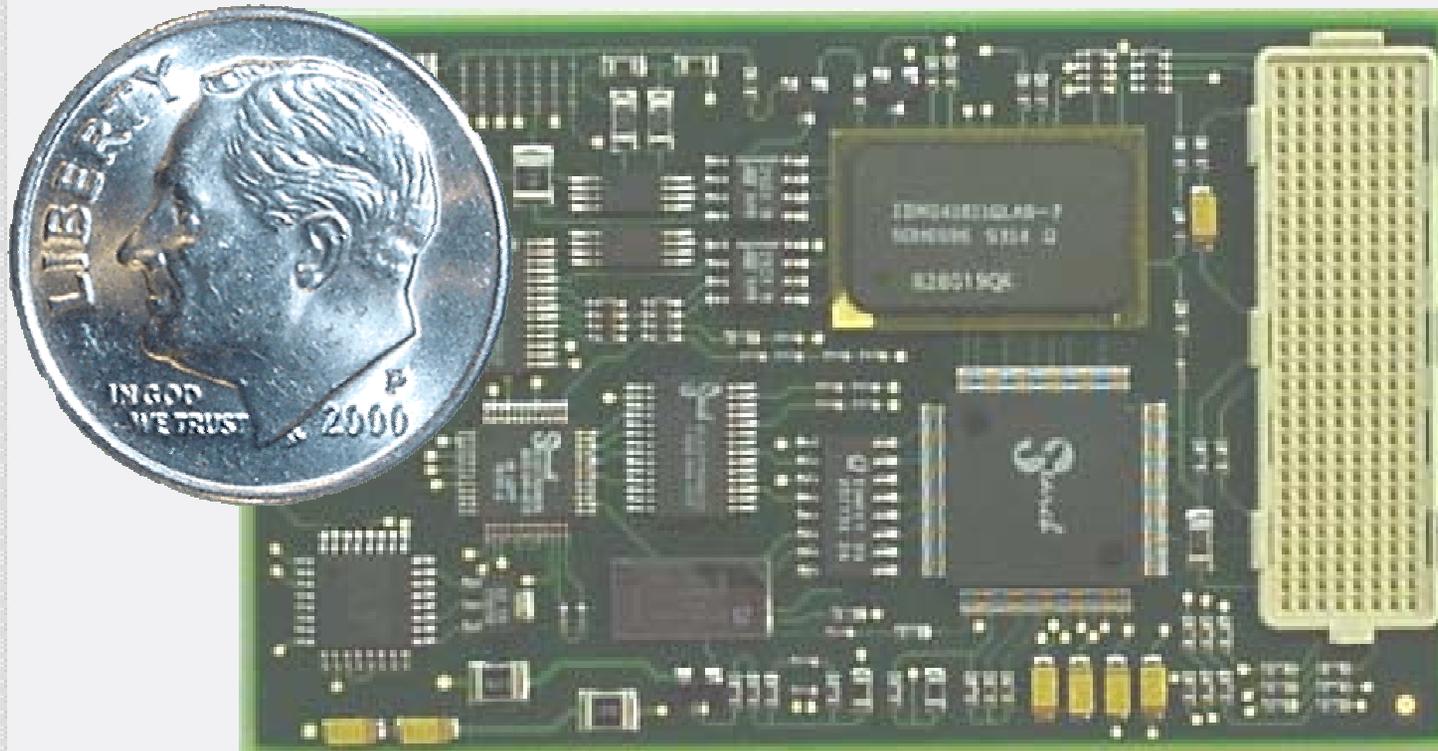
- Upgrade to micro
 - School classrooms ↑ 69 stations
 - Mini stations ↑ 114
 - Portables ↑ 200 + microscope
- Exported training
 - 5 to 6 wks., cost \$3-6K more per convening
 - \$70K for equipment

MN/MC Consequences

- What about submariners?
- Technology insertion



New Technologies



Summary

- NMCI implications
- NEC consolidation
- Equipment and future needs
- Training at Yokosuka
- Certification and documentation

Summary

- Workmanship indicative of the program
- Task Force EXCEL
- New technologies and the future of 2M

